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INTRODUCTION.

This REVIEW is based on reports for November, 1889, from 2,217 regular and voluntary observers in the United States and Canada. These reports are classified as follows: 177 reports from Signal Service stations; 120 monthly reports from United States Army post surgeons; 1,407 monthly reports from state weather service and voluntary observers; 17 reports of rainfall observations in Arizona furnished by the United States Geological Survey; 25 reports from Canadian stations; 168 reports through the Central Pacific Railway Company; 303 marine reports through the co-operation of the Hydrographic Office, Navy Department; marine

reports through the "New York Herald Weather Service;" monthly weather reports from the local weather services of Alabama, Arkansas, Colorado, North and South Dakota, Illinois, Indiana, the Iowa Weather Crop Bulletin Service, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Meteorological Report of the Missouri State Board of Agriculture, Nebraska, Nevada, New England, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, South Carolina, Tennessee, and Texas, and international simultaneous observations. Trustworthy newspaper extracts and special reports have also been used.

CHARACTERISTICS OF THE WEATHER FOR NOVEMBER, 1889.

The most important storm of the month over the eastern part of the country appeared on the Texas coast on the morning of the 26th, whence it moved northeastward to the lower lake region by the 27th, attended in the Mississippi and Missouri valleys by rain or snow. During the 27th and 28th the storm increased in strength and swept eastward over the lower lake region, New York, and the Saint Lawrence Valley, attended by snow in the Lake region and the Ohio Valley and Tennessee, heavy rain in New York and New England, destructive gales on the lakes and in the Saint Lawrence Valley and New England, and a heavy snow storm, the first of the season, in the Province of Quebec. A notable feature for November was the heavy snow storm which prevailed in northeastern New Mexico, extreme northern Texas, southwestern Kansas, and southeastern Colorado during the early part of the month. This storm was accompanied by high wind and low temperature and occasioned loss of life and considerable destruction of live stock. Destructive local storms, resulting in loss of life and damage to property, were reported at New Berne, N. C., on the 21st, and in the northern part of Beaufort county, N. C., on the 28th. The severest storms on the north Atlantic Ocean prevailed over and near the Banks of Newfoundland from the 11th to 13th, and over mid-ocean on the 14th, when gales of hurricane force were reported.

The highest temperature reported was 94°, at Casa Grande, Ariz., and Smithville, Ga., and the lowest temperature reported was -28°, at Fort Buford, N. Dak. At Savannah, Ga., Jacksonville, Fla., Vicksburg, Miss., Fort Canby and Neah Bay, Wash., and Astoria, Oregon, the maximum temperature was as high or higher than previously reported for November, and at Augusta, Ga., Lava, N. Mex., and Fort Thomas, Ariz., the minimum temperature was as low or lower than noted for the corresponding month of preceding years. The month was warmer than the average November in the Lake region, upper Ohio valley, northern Minnesota, Canada, the Atlantic coast states, the plateau and Rocky Mountain regions west of the one hundred and tenth meridian, and on the Pacific coast;

elsewhere the weather was cooler than usual. In districts where the temperature was above the average the departures were less than 5°, while in central Texas and central Colorado the departures below the average temperature for November exceeded 5°. At Newburyport and Somerset, Mass., Orono, Me., and Eola, Oregon, the average temperature was the highest ever reported for November, and at Lead Hill, Ark., and Grand Coteau, La., the November, 1889, average temperature was lower than reported for the corresponding month of preceding years. For the period January 1 to November 30, 1889, inclusive, the greatest average excess in temperature is noted for the extreme northwest, where it amounts to 33°.3, and the greatest average deficiency is shown for the southeastern slope of the Rocky Mountains, where it is 23°.2. Frost was reported as far south as Lee county, Fla., on the 30th. The first killing frost of the season occurred in Alabama on the 29th and 30th. In Mississippi all vegetation was reported as having been killed by heavy frost on the 29th. In Texas frost occurred as far south as Brownsville on the 17th. On the Pacific coast frost occurred as far south as Los Angeles, Cal., on five dates.

The heaviest rainfall for the month fell in central Arkansas, where 16.25 inches were reported at Heber, Cleburne Co.; and the precipitation exceeded ten inches in northeastern California, east-central Texas, east-central Pennsylvania, northeastern Maryland, northern New Jersey, extreme southeastern New York, and west-central Connecticut. In areas in the interior of Nevada, extreme northwestern Utah, east-central Arizona, and western Nebraska, no precipitation was reported; and at stations in southern California, the Dakotas, western Minnesota, central Mississippi, and central Florida, less than one-half inch was reported. The precipitation exceeded the average amount for November on the middle Pacific coast, and east of the Rocky Mountains, except on the northeastern slope of the Rocky Mountains, in the extreme northwest, and in the Rio Grande Valley; elsewhere the precipitation was below the average for November. The greatest excesses in precipitation were noted in extreme southeastern New York and in central Arkansas, where the precipitation was six and five inches, respectively, above the average, and the greatest deficiencies

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Chief Signal Officer.*